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**(54) SEMICONDUCTOR
OPTICAL GATE
AMPLIFIER SWITCH**

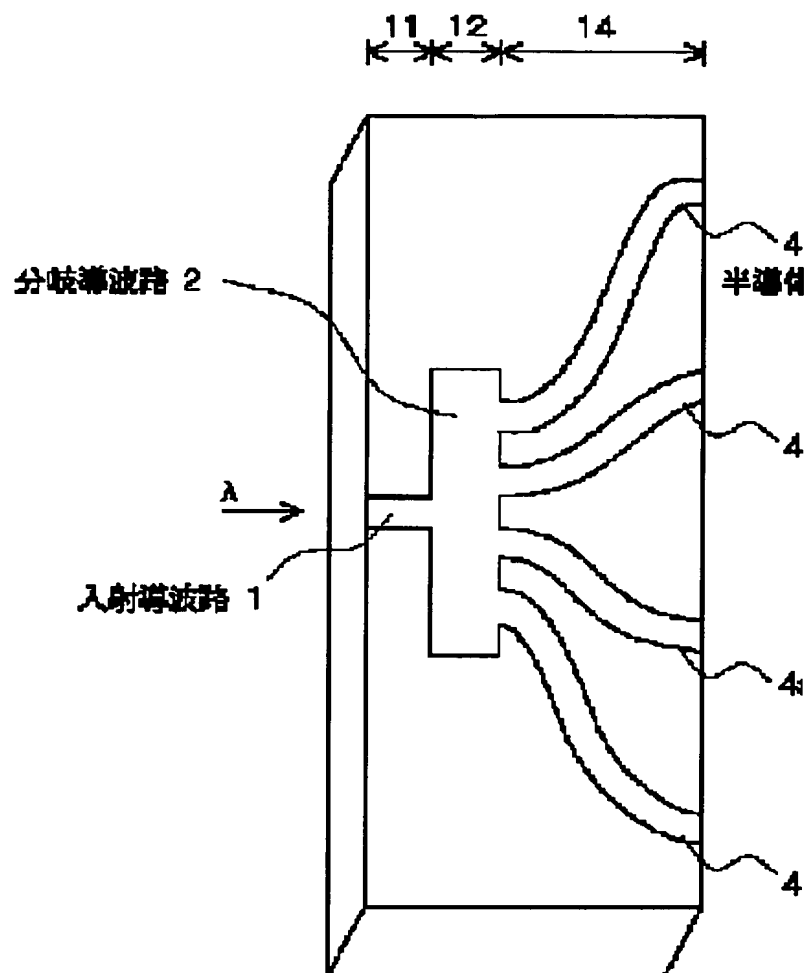
(57) Abstract:

PROBLEM TO BE SOLVED: To obtain an optical switch which is small in size, is relatively simple in structure and may be produced at a good yield by including curvilinear waveguides into N pieces of semiconductor amplifiers.

SOLUTION: The semiconductor optical amplifier gate type switch of a 1×4 type comprise an incident waveguide 1, branch waveguides 2 of an MMI (multimode interference) structure of the 1×4 type and semiconductor amplifier gates 41 to 44 including the curvilinear waveguides of 300 μm in curvature. The switch is divided to an incident waveguide region 11 corresponding to the incident waveguide 1 and a branch waveguide region 12 corresponding to the branch waveguides 2 and semiconductor amplifier gate regions 14 corresponding to the semiconductor optical amplifier gates 41 to 44. All these regions are formed as active

regions. The incident waveguide region 11 and the branch waveguide regions 12 are driven as optical amplifier regions by the same electrodes. The respective semiconductor optical amplifier gates 41 to 44 are driven by using respectively different electrodes, by which gate operation is carried out.

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